

II. CLAIM AMENDMENTS

1-14. (Cancelled)

15. (Currently Amended) A method for processing directed sound in an acoustic virtual environment in an electronic device, said acoustic virtual environment comprising at least one sound source, the method comprising:

attaching a reference direction and a set of selected directions to the at least one sound source, each selected direction differing from said reference direction,

establishing a direction dependent filtering arrangement having at least one parameter disposed to at least partly determine a filtering effect of the direction dependent filtering arrangement, said at least one parameter enabling the direction dependent filtering arrangement to model that said at least one sound source radiates a different sound to said reference direction than to a direction that deviates from said reference direction,

for each selected direction defining at least one value for each of said at least one parameter, and

filtering, with the direction dependent filtering arrangement, a signal that represents sound propagating from said at least one sound source in said reference direction in order to produce a signal that represents sound ~~propagating~~ propagating from said at least one sound source in said direction that deviates from said reference direction.

16. (Previously Presented) A method according to claim 15, wherein the establishing the direction dependent filtering arrangement comprises associating a filter with each selected direction so that a filtering effect of a filter relating to each selected direction

depends on the at least one value of said at least one parameter relating to the selected direction in question.

17. (Previously Presented) A method according to claim 15, wherein the at least one value of said at least one parameter relating to a certain selected direction determines an amplification factor that is disposed to determine amplification of the signal representing the sound emitted by said at least one sound source when listened to from a direction corresponding with the selected direction in question.

18. (Previously Presented) A method according to claim 15, wherein the at least one value of said at least one parameter relating to a certain selected direction determine separate amplification factors that are disposed to determine amplifications for different frequencies of the signal representing the sound emitted by said at least one sound source when listened from a direction corresponding with the selected direction in question.

19. (Previously Presented) A method according to claim 15, wherein the values of said at least one parameter relating to a certain selected direction are the coefficients $[b_0 \ b_1 \ a_1 \ b_2 \ \tilde{a}_2]$ of the quotient expression

$$H(z) = \frac{Y(z)}{X(z)} = \frac{\sum_{k=0}^M b_k z^{-k}}{1 + \sum_{k=1}^N a_k z^{-k}}$$

that is disposed to determine a Z-transform of a transfer function of the direction dependent filtering arrangement, X representing the z-transform of the signal representing the sound emitted by said at least one sound source, Y representing the Z-transform of a signal representing the sound listened from a direction corresponding with the selected direction in question, M and N being upper limits for defining accuracy

at which it is desired to define the transfer function, z representing a Z-transform variable, and k being a summation index.

20. (Previously Presented) A method according to claim 16, comprising interpolation between said filters in order to model how the sound emitted by said at least one sound source sounds when listened to from a direction that differs from the reference direction and each selected direction.

21. (Previously Presented) A method according to claim 15, comprising:

generating in a transmitting device said acoustic virtual environment comprising said at least one sound source,

performing in the transmitting device, defining the reference direction and the set of selected directions, establishing the direction dependent filtering arrangement having said at least one parameter, and the defining said at least one value of said at least one parameter for each selected direction,

transmitting from said transmitting device to a receiving device information about the direction dependent filtering arrangement,

receiving in the receiving device said information about the direction dependent filtering arrangement,

reconstructing in the receiving device the direction dependent filtering arrangement on the basis of said information, and

performing in the receiving device, filtering the signal representing the sound emitted by the at least one sound source with the direction dependent filtering arrangement.

22. (Previously Presented) A method according to claim 21, wherein the transmitting device transmits to the receiving device information about the direction dependent filtering arrangement as a part of a data stream according to the MPEG-4 standard.

23. (Previously Presented) A method according to claim 15, wherein at least one sound source is a real sound source.

24. (Previously Presented) A method according to claim 15, wherein at least one sound source is a reflection.

25. (Previously Presented) A system for processing directed sound in an acoustic virtual environment in an electronic device, said acoustic virtual environment comprising at least one sound source, the system comprising:

means for attaching a reference direction and a set selected directions to the at least one sound source, each selected direction differing from said reference direction,

a direction dependent filtering arrangement disposed to filter a signal that represents sound propagating from said at least one sound source in said reference direction in order to produce a signal that represents sound propagating from said at least one sound source in a direction that deviates from said reference direction, the direction dependent filtering arrangement having at

least one parameter disposed to at least partly determine a filtering effect of the direction dependent filtering arrangement, said at least one parameter enabling the direction dependent filtering arrangement to model that said at least one sound source radiates a different sound to said reference direction than to said direction that deviates from said reference direction , and

means for associating a value for each of said at least one parameter with each selected direction.

26. (Previously Presented) A system according to claim 25, comprising a transmitting device and a receiving device and means for realizing an electrical communication between the transmitting device and the receiving device.

27. (Previously Presented) A system according to claim 26, comprising multiplexing means in the transmitting device for adding data describing the direction dependent filtering arrangement to a data stream according to the MPEG-4 standard, and de-multiplexing means in the receiving device for extracting said data describing the direction dependent filtering arrangement from the data stream according to the MPEG-4 standard.

28. (Previously Presented) A system according to claim 26, comprising multiplexing means in the transmitting device for adding data describing the direction dependent filtering arrangement to a data stream according to the extended VRML97 standard, and de-multiplexing means in the receiving device for extracting said data describing the direction dependent filtering arrangement from the data stream according to the extended VRML97 standard.

29. (New) An electronic device for processing directed sound of an acoustic virtual environment, the acoustic virtual environment comprising at least one sound source, the electronic device comprising:

circuitry that attaches a reference direction and a set of selected directions to the at least one sound source, each selected direction differing from the reference direction,

a direction dependent filtering arrangement that filters a signal that represents sound propagating from the at least one sound source in the reference direction in order to produce a signal that represents sound propagating from the at least one sound source in a direction that deviates from the reference direction, the direction dependent filtering arrangement having at least one parameter that at least partly determines a filtering effect of the direction dependent filtering arrangement, the at least one parameter enabling the direction dependent filtering arrangement to model that the at least one sound source radiates a different sound to the reference direction than to the direction that deviates from the reference direction, and

circuitry that associates a value for each of said at least one parameter with each selected direction.

30. (New) A system for processing directed sound in an acoustic virtual environment in an electronic device, the acoustic virtual environment comprising at least one sound source, the system comprising:

circuitry that attaches a reference direction and a set of selected directions to the at least one sound source, each selected direction differing from the reference direction.

- a direction dependent filtering arrangement that filters a signal that represents sound propagating from the at least one sound source in the reference direction in order to produce a signal that represents sound propagating from the at least one sound source in a direction that deviates from the reference direction, the direction dependent filtering arrangement having at least one parameter disposed to at least partly determine a filtering effect of the direction dependent filtering arrangement, the at least one parameter enabling the direction dependent filtering arrangement to model that the at least one sound source radiates a different sound to the reference direction than to the direction that deviates from the reference direction, and
- circuitry that associates a value for each of the at least one parameter with each selected direction.